

Welcoming ambiguity in dental medicine -- an opportunity for curricular development?

2017

Paul C. Edwards, MS, DDS

As oral and maxillofacial pathologists, we are all aware of the critically important responsibility of rendering a definitive tissue diagnosis on biopsy tissue sent to us by our surgical colleagues. While a diagnosis can be reached in the vast majority of cases, we are also all acutely sensitive to the fact that, on occasion, there may be enough ambiguity that attempting to offer a definitive diagnosis may not be in the best interests of our patients. Examples that immediately come to mind include small, fragmented biopsy specimens that are not conclusively representative of a much larger lesion and epithelial atypia in the presence of other potentially confounding features, such as extensive inflammation or ulceration and lichenoid change. Is the epithelial atypia reactive or preneoplastic? Does the lichenoid infiltrate represent true oral lichen planus, a lichenoid reaction to restorative material, or an inflammatory response to antigenic changes from altered basal epithelium? While we certainly must offer our best expert interpretation, acknowledging potential ambiguity in such cases is critically important to the referring clinician, and ultimately, the patient.

Nevertheless, as pathologists we are as frustrated by these occasional uncertainties as are our referring surgical colleagues. Excised tissue represents, after all, the diagnostic gold standard. This frustration is, in part, a reflection of the underlying premise that any uncertainty in the diagnostic process should be viewed as an unwelcome failure. How else can the hundreds of manuscripts that attempt to predict survival of patients with oral squamous cell carcinoma based on a single molecular, histopathologic, or immunohistochemical feature be explained? This by no means suggests, however,

This is the author's manuscript of the article published in final edited form as:

Edwards, P. C. (2017). Welcoming ambiguity in dental medicine—an opportunity for curricular development? *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, 123(3), 281–282.
<https://doi.org/10.1016/j.oooo.2016.12.006>

that we should abandon research aimed at reducing ambiguity or promoting development of clear diagnostic or therapeutic protocols.¹ The fact remains that uncertainty is an important motivator of research inquiry. Moreover, many of these exploratory forays contribute to the overall body of knowledge that ultimately offers greater insight into disease pathogenesis. Nevertheless, uncertainty is an inescapable reality of dental medicine: indecision regarding a patient's diagnosis, ambiguity with respect to which treatment will afford the best outcome, and uncertainty as to the anticipated response to therapy or a patient's ability to tolerate treatment.

A recent article in the *New England Journal of Medicine*² on the failure of medical education to address the role of uncertainty in medicine, highlights, I believe, similar shortcomings in our current approach to dental education. As dental educators, we tend to embrace the belief that imparting to our students sufficient foundational knowledge will give them the underpinning needed to ultimately become skilled clinicians. This approach certainly has some validity, but in many ways it fails to fully prepare our graduates for the complexities and uncertainties associated with the provision of health care.³ As educators, we try to avoid ambiguity and uncertainty, too often communicating information to our students as unequivocal facts: ameloblastomas are benign odontogenic cysts, except when they metastasize; early diagnosis is always associated with greater survival, ignoring lead time bias, length-biased sampling, and variability in an individual tumor's biologic aggressiveness⁴; mild oral epithelial dysplasia is a surgically treatable disease. This is reinforced by the all-too-common multiple-choice approach to assessment, which requires, by its very nature, a single correct answer. Traditional, high-stakes national board examinations only serve to further promulgate this rather simplistic approach to dental education. This aversion to uncertainty continues as students enter the clinical phase of their education—witness the frustration expressed by dental students over treatment plans that regularly change, depending on the faculty member with whom a student works. Senior clinical administrators regularly attribute this variability in treatment approach to “poor faculty calibration,” ignoring that

much of what we do in dental medicine lacks evidence-based treatment guidelines to effectively guide clinical decision-making.

In medicine, increased tolerance toward uncertainty appears to be correlated with greater empathy toward patients, better ability to deal with grief and loss, and a tendency to order fewer unnecessary diagnostic tests.⁵ Interestingly, studies^{5,6} suggest that in the current medical school environment, which has similarities to but also clear differences from predoctoral dental education, the average student's ability to tolerate ambiguity remains constant, or even decreases, as they progress through the curriculum, despite increasing levels of instruction in evidence-based medicine.

The benefits of embracing ambiguity and uncertainty in the dental curriculum would, presumably, be comparable to those seen in medicine. Decreasing our reliance on a top-down method of teaching, in which we deliver definitive “truths” to our students, will encourage students to accept greater responsibility for their education,⁷ somewhat analogous to problem-based learning. Recognizing diagnostic and prognostic uncertainty leads to improved diagnostic outcomes, as practitioners fully embrace the need to continually reassess their initial diagnosis and treatment in response to new data. Moreover, although many clinicians develop a greater understanding of and tolerance for uncertainty as they gain clinical experience, graduating clinicians who are more at ease with clinical ambiguity experience lower levels of stress and reduced professional burnout early in their careers. Finally, increased curricular focus on the many uncertainties in dental medicine may encourage more students to pursue careers in clinical or transitional research, as they come to recognize the tremendous opportunities for discovery in the field of dentistry.

References

1. Gill JS, Stojanovic M, Simopoulos TT. In defense of the meticulous: a case against ambiguity, and a time to standardize. *Pain Physician*. 2016;19:E657-E658.
2. Simpkin AL, Schwartzstein RM. Tolerating uncertainty - the next medical revolution? *N Engl J Med*. 2016;375:1713-1715.
3. Durning SJ, Lubarsky S, Torre D, Dory V, Holmboe E. Considering “nonlinearity” across the continuum in medical education assessment: supporting theory, practice, and future research directions. *J Contin Educ Health Prof*. 2015;35:232- 243.
4. Croswell JM, Ransohoff DF, Kramer BS. Principles of cancer screening: lessons from history and study design issues. *Semin Oncol*. 2010;37:202-215.
5. Weissenstein A, Ligges S, Brouwer B, Marschall B, Friederichs H. Measuring the ambiguity tolerance of medical students: a cross-sectional study from the first to sixth academic years. *BMC Fam Pract*. 2014;15:6.
6. Han PK, Schupack D, Daggett S, Holt CT, Strout TD. Temporal changes in tolerance of uncertainty among medical students: in-sights from an exploratory study. *Med Educ Online*. 2015;20: 28285.
7. Brown S. “Not knowing” as a pedagogic strategy in the sciences. *Radical Pedagogy*. 2013;10:6.